

# **United Arab Emirates**

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# **United Arab Emirates**

The United Arab Emirates (UAE) is important to world energy markets because it contains 98 billion barrels, or nearly 10%, of the world's proven oil reserves. The UAE also holds the world's fifth-largest natural gas reserves and exports significant amounts of liquefied natural gas.

Note: Information contained in this report is the best available as of November 2001 and can change.



# GENERAL BACKGROUND

Economic growth has slowed sharply in the United Arab Emirates (UAE) over the last year, as oil prices have declined from the relatively high levels of 1999 and 2000. Still, real growth in gross domestic product (GDP) is projected at 4.0% for 2001, after reaching 7.9% in 2000. The UAE economy is somewhat more diversified than most of the other Persian Gulf oil exporters, which has mitigated some of the effect of the fall in

oil prices.

### **Government Structure**

The UAE is a federation of seven emirates - Abu Dhabi, Dubai, Sharjah, Ajman, Fujairah, Ras al-Khaimah, and Umm al-Qaiwain. Political power is concentrated in Abu Dhabi, which controls the vast majority of the UAE's economic and resource wealth. The two largest emirates -- Abu Dhabi and Dubai -- provide over 80% of the UAE's income. In June 1996, the UAE's Federal National Council approved a permanent constitution for the country. This replaced a provisional document which had been renewed every five years since the country's creation in 1971. The establishment of Abu Dhabi as the UAE's permanent capital was one of the new framework's main provisions.

#### **Other Industry**

In recent years, the UAE has undertaken several projects to diversify its economy and to reduce its dependence on oil and natural gas revenues. The non-oil sectors of the UAE's economy presently contribute more than two-thirds of the UAE's total GDP, and about 30% of its total exports. The federal government has invested heavily in sectors such as aluminum production, tourism, aviation, re-export commerce, and telecommunications. As part of its strategy to further expand its tourism industry, the UAE is building new hotels, restaurants and shopping centers, and expanding airports and duty-free zones. Dubai has become a

central Middle East hub for trade and finance, accounting for about 70% of the Emirates' non-oil trade. The UAE has been a member of the World Trade Organization (WTO) since 1995, and has one of the most open economies in the region.

#### **Foreign Affairs**

The UAE and Iran continue to dispute the ownership of three islands, Abu Musa and the Greater and Lesser Tunb Islands, which are strategically located in the Strait of Hormuz. All three islands were effectively occupied by Iranian troops in 1992. The Mubarak field, which is located six miles off Abu Musa, has been producing oil and associated natural gas since 1974. In 1995, the Iranian Foreign Ministry claimed that the islands are "an inseparable part of Iran." Iran rejected a 1996 proposal by the Gulf Cooperation Council (GCC) for the dispute to be resolved by the International Court of Justice, an option supported by the UAE. In early 1996, Iran took further moves to strengthen its hold on the disputed islands. These actions included starting up a power plant on Greater Tunb, opening an airport on Abu Musa, and announcing plans for construction of a new port on Abu Musa. In the dispute, the UAE has received strong support from the GCC, the United Nations, and the United States. Although Iran remains a continuing concern for officials in Abu Dhabi, they have chosen not to escalate the territorial dispute. Iran is one of Dubai's major trading partners, accounting for 20% to 30% of Dubai's business.

Relations between Saudi Arabia and the UAE also have shown some signs of strain during recent years, due to Saudi development of the Shaybah oilfield, with estimated reserves of 14 billion barrels of crude oil. The UAE and Saudi Arabia do not have a precisely defined border in the sparsely populated desert separating them, and the Shaybah field straddles territory claimed by both governments. Saudi Arabia began production from the Shaybah field in late 1998. The UAE has demanded an agreement to share production from Shaybah.

#### **OIL**

The UAE contains proven crude oil reserves of 97.8 billion barrels, or slightly less than 10% of the world total. Abu Dhabi holds 94% of this amount, or about 92.2 billion barrels. Dubai contains an estimated 4.0 billion barrels, followed by Sharjah and Ras al-Khaimah, with 1.5 billion and 100 million barrels of oil, respectively.

The majority of the UAE's crude oil is considered light, with gravities in the 32° to 44° API range. Abu Dhabi's Murban 39° and Dubai's Fateh 32° blends are the UAE's primary export crudes. Most of the UAE's oil fields have been producing since the 1960s or early 1970s. Proven oil reserves in Abu Dhabi have doubled in the last decade, mainly due to significant increases in rates of recovery. Abu Dhabi has continued to identify new finds, especially offshore, and to discover new oil-rich structures in existing fields.

Under the UAE's constitution, each emirate controls its own oil production and resource development. Although Abu Dhabi joined OPEC in 1967 (four years before the UAE was formed), Dubai does not consider itself part of OPEC or bound by its quotas.

The UAE's current OPEC production quota (effective September 1, 2001) is 2.03 million bbl/d, and its crude oil production is the third quarter of 2001 was 2.15 million bbl/d. OPEC has cut production quotas three times in 2001, in February, April, and September. The UAE's total capacity is 2.65 million bbl/d, making it second only to Saudi Arabia for excess production capacity among OPEC member states.

The Abu Dhabi National Oil Company (ADNOC) is currently planning a limited opening of UAE upstream oil production to foreign firms. The initial asset sale will involve 28% of the offshore Upper Zakhum field, which currently produces around 500,000 bbl/d. Bids have been solicited from BP, Shell, ExxonMobil, and TotalFinaElf. The Japan Oil Development Company (Jodco), which currently owns a 12% stake in the field, reportedly also is interested. A decision on the sale is expected in early 2002.

#### **Refining**

The UAE has two refineries operated by ADNOC. The Ruwais refinery underwent a \$100-million upgrade

in 1995 to a capacity of 145,000 bbl/d. It produces light products mainly for export to Japan and India. Fuel oil from Ruwais is sold as bunkers by ADNOC and also used for domestic power generation. A \$1.2-billion second-phase Ruwais expansion is to include a new 135,000-bbl/d crude distillation unit, a 130,000-bbl/d fractionation plant, and expansion of residual oil conversion facilities with a 40,000-bbl/d hydrocracker and a 36,000-bbl/d visbreaker. ADNOC began processing condensate from the Bab and Asab fields at the fractionation unit in May 2000. When the rest of the project is completed by 2003, Ruwais' total capacity will be around 415,000 bbl/d.

UAE has four smaller refineries. Umm al-Nar, in Abu Dhabi, has a capacity of 88,500 bbl/d. Since its construction in 1976, the Umm al-Nar plant has undergone debottlenecking as well as a recent expansion. The refinery primarily supplies the domestic market. Metro Oil has a 90,000-bbl/d refinery in Fujairah. The Emirates National Oil Company (ENOC) Jebal Ali condensate refinery, with a capacity of 120,000 bbl/d, began operation in Dubai in May 1999. A 40,000 bbl/d second-hand gasoline unit, owned by the private firm ISO Octane, opened near Jebal Ali in May 2000.

# **Foreign Downstream Operations**

In October 1998, the International Petroleum Investment Company (IPIC), the UAE's downstream investment outfit, purchased 50% of the Hyundai Oil Refinery Company of South Korea for \$500 million. The UAE is the second-largest crude oil supplier to South Korea after Saudi Arabia. IPIC's overseas holdings also include a 10% stake in Spain's CEPSA and a 19.6% share of Austria's OMV.

# **NATURAL GAS**

The UAE's natural gas reserves of 212 trillion cubic feet (Tcf) are the world's fifth largest after Russia, Iran, Qatar, and Saudi Arabia. The largest reserves of 196.1 Tcf are located in Abu Dhabi. Sharjah, Dubai, and Ras al-Khaimah contain smaller reserves of 10.7 Tcf, 4.1 Tcf, and 1.1 Tcf, respectively. In Abu Dhabi, the non-associated Khuff natural gas reservoirs beneath the Umm Shaif and Abu al-Bukhush oil fields rank among the world's largest. Current natural gas reserves are projected to last for about 150-170 years.

Increased domestic consumption of electricity and growing demand from the petrochemical industry have provided incentives for the UAE to increase its use of natural gas. Over the last decade, natural gas consumption in Abu Dhabi has doubled, and is projected to reach 4 billion cubic feet per day (bcf/d) by 2005. The development of natural gas fields also results in increased production and exports of condensates, which are not subject to OPEC quotas.

#### **Projects**

The past few years have seen the UAE embark on a massive multi-billion dollar program of investment in its natural gas sector including a shift toward natural gas-fired power plants and the transformation of the Taweelah commercial district into a natural gas-based industrial zone. An ambitious plan, the *Dolphin Project*, to interconnect the natural gas grids of Qatar, the UAE, and Oman, also is planned.

The second phase of the UAE's \$1-billion onshore natural gas development program (OGD-2) at the Habshan complex located directly over the huge Bab oil and natural gas field was completed in early 2001. This second phase included the construction of four trains to process 1 bcf/d of natural gas, 300-500 tons per day (t/d) of natural gas liquids, 35,000-55,000 t/d of condensate and up to 2,100 t/d of sulphur. Additional capacity expansion is planned in the third phase, OGD-3, and will involve the construction of two additional natural gas processing trains. Bids for a front end engineering and design (FEED) contract for the project were solicited in September 2001.

Another project closely linked with OGD-2 is the Asab natural gas development project, which was completed in 1999. The Asab development processes around 830 million cubic feet per day (Mmcf/d) of associated wet natural gas from the Thamama F and G reservoirs and produces up to 100,000 bbl/d of condensate for processing at the Ruwais refinery. The natural gas also will support other industries in Ruwais and be re-injected into Asab reservoirs to maintain field pressure. The \$700-million project was awarded to Snamprogetti in June 1997 by UAE's Supreme Petroleum Council.

# **Supplying Dubai**

Dubai's natural gas consumption is expected to grow by nearly 7% annually through 2005, due to expansion of the emirate's industrial sector, a switch to natural gas by its power stations, and the need for an enhanced oil recovery (EOR) system based on natural gas injections for its dwindling oil formations. Dubai projects future demand will average 810 Mmcf/d in 2005, with major swings between summer and winter consumption patterns. Until mid-2001, Dubai's entire natural gas supply came entirely from fellow UAE member Sharjah, which transports about 430 Mmcf/d. BP operates three fields and the 800-Mmcf/d Sajaa processing facility in conjunction with the Sharjah government. In May 2001, a pipeline from the Maqta area of Abu Dhabi to Dubai commenced operation, delivering 200 Mmcf/d of natural gas. Pipeline throughput is expected to eventually reach a maximum of 1.1 Bcf/d as Dubai's natural gas demand grows.

# **The Dolphin Project**

The Dolphin Project aims to develop links between the natural gas infrastructures of Qatar, the UAE, and Oman, with a possible future link to the Indian Subcontinent. It will allow the export of non-associated natural gas from Qatar's massive offshore North Dome field. A Statement of Principles for the project was signed in March 1999 between the UAE Offsets Group (UOG) and the Qatar General Petroleum Corporation (QGPC). The two firms signed a natural gas sales agreement in March 2001, with natural gas supplies to start in late 2005. Estimated to cost \$8-10 billion over the next decade, the project will begin as a subsea pipeline from Ras Laffan in Qatar to a landfall in Abu Dhabi, which will then be extended to Dubai and northern Oman. It will start at 48 inches in diameter, narrowing to 30 inches by the time it reaches Oman. In its initial phase, the pipeline is to carry 3 Bcf/d of Qatari natural gas to the UAE and Oman, accounting for nearly 10% of total world natural gas supplies shipped by pipeline.

In October 1999, UOG and ADNOC issued a joint declaration dividing up natural gas distribution between them. Natural gas from the Dolphin Project will be the exclusive supply for natural gas-fired power plants, except in the Western Region of Abu Dhabi, and will also supply natural gas for ADNOC contracts with Dubai. Natural gas from the Dolphin Project will use the ADNOC distribution network until the project develops its own network. In March 2000, UOG signed a contract with two foreign firms, TotalFinaElf and Enron, after securing purchase agreements with Abu Dhabi, Dubai, and Oman. Originally, the two main foreign firms participating in the project were Enron and TotalFinaElf. In May 2001, however, Enron announced that it was backing out of the project, and selling its 24.5% stake back to UOG. UOG has been actively seeking another firm to take Enron's place, and announced a short list of five companies - BP, Conoco, ExxonMobil, Occidental, and Shell - in August 2001 to bid on Enron's former stake.

The proposed extension from Oman to Pakistan might be built in 2005 or later. India also reportedly held preliminary discussions with the UAE on natural gas supplies in mid-2001. This phase of the project is dependent on Pakistan's ability to pay for the natural gas, which is questionable given the current weakness of its economy. Current regional tensions make an extension to India unlikely in the near future.

# **ELECTRICITY**

The UAE's soaring demand for electric power, coupled with volatile swings in peak loads, led the Emirates in 1997 to form a Privatization Committee for the Water and Electricity Sector. In early 1998, the committee called for a comprehensive restructuring, including the elimination of the state-owned Abu Dhabi Water and Electricity Department (ADWED). ADWED was transformed into a regulatory body, the Abu Dhabi Water and Electricity Authority (ADWEA). The government plans to take a majority holding in the new ventures with minority interests held by foreign firms. The government may gradually privatize its shares through initial public offerings (IPOs), allowing UAE nationals to become shareholders, though this is uncertain.

TotalFinaElf and Tractebel were awarded a contract by ADWEA in August 2000 for an upgrade to the Taweelah A-1 plant, which will also give a 20% ownership stake to each of the foreign partners, with the rest remaining with ADWEA. The upgrade will bring the capacity of the plant to 1,350 megawatts (MW).

Another step in the reorganization is the expansion of the Taweelah cogeneration facility. The expansion,

known as Taweelah A-2, is the UAE's first independent water and power project (IWPP), and reached financial close in April 1999. It is the second independent power project in the Gulf after Oman's al-Manah facility. With a price tag of some \$800 million, the expansion is to add about 763 megawatts (MW) of power and 50 million gallons of desalinated water to the UAE's supplies. The first 370-MW came online in July 2000. The rest of the generating units became operational in August 2001. The Taweelah A-2 project is run by Emirates CMS Power, a joint venture between CMS Energy (40% ownership interest) and the newlyformed Emirates Power Company (EPC) (60%).

The al-Taweelah Power Company will manage the Taweelah B facility. The plant, which currently has six 122-MW steam turbines and six 13 million gallon-per-day (g/d) multi-stage flash units, is now undergoing a \$360 million expansion. The addition of two new natural gas-turbine units will bring the plant's capacity to 1,220 MW and 103 million g/d of water. The Umm al-Nar Power Company will operate the plant by the same name with a 1,215-MW, 97-million-g/d facility, which will be upgraded with two new 3.5 million g/d desalination units. The new units run on steam already available at the site. The company also will operate the 120-MW Baniyas station.

The Abu Dhabi Water and Electricity Authority (ADWEA) signed a contract for the Shuweihat IWPP project in August 2001 with a consortium of CMS Energy and International Power PLC. The \$1.6 billion deal provides for the construction and operation of a 1,500-MW combined cycle plant with a desalination capacity of 100 million gallons per day. Construction is to begin in early 2002, with commercial operation set for mid-2004.

The UAE also is taking part in a \$1-billion plan to build a regional power grid throughout the countries of the Gulf Cooperation Council (GCC). The first phase of the plan would link Saudi Arabia, Kuwait, Bahrain and Qatar; the UAE and Oman would join the grid in the second phase of the plan. GCC electricity ministers signed a final agreement on the project in June 1999. The plan is based on the assumption that each country will have its own unified power grid, and the UAE is doing its part by connecting all the power stations along its western coast with the central region.

Sources for this report include: CIA World Factbook 2001; Dow Jones News Wire service; Economist Intelligence Unit ViewsWire; Oil and Gas Journal; Petroleum Economist; Petroleum Intelligence Weekly; International Market Insight Reports; U.S. Energy Information Administration; WEFA Middle East Economic Outlook; World Gas Intelligence.

# **COUNTRY OVERVIEW**

President: Sheikh Zayed bin Sultan Al Nahayan

**Prime Minister:** Sheikh Maktoum bin Rashid al-Maktoum **Independence:** December 2, 1971 (from United Kingdom)

Population (2001E): 2.4 million

Location/Size: Persian Gulf between Oman and Saudi Arabia/30,000 square miles

**Major Cities:** Abu Dhabi (capital), Dubai, Sharjah, al-Ain **Languages:** Arabic (official), Persian, English, Hindi, Urdu

Ethnic Groups: Emirati (19%), other Arab and Iranian (23%), South Asian (50%), other expatriate

(Western and East Asian) 8%.

**Religion:** Muslim 96% (Shi'a 16%), Christian, Hindu, Other 4%

**Defense (1998):** Total manpower 64,500 (Army 59,000; Air Force 4,000; Navy 1,500)

# **ECONOMIC OVERVIEW**

**Currency:** Dirham (AED)

Market Exchange Rate (11/6/01): US\$1 = 3.67 Dirhams

**Gross Domestic Product (2001E):** \$66.5 billion

Real GDP Growth Rate (2001E): 4.0%

Inflation Rate (consumer prices)(2001E): 3.7% Current Account Balance (2001E): \$13.2 billion

Major Trading Partners: Japan, United Kingdom, United States, Singapore, Germany, South Korea, Iran,

India

Merchandise Exports (2001E): \$64.9 billion Merchandise Imports (2001E): \$48.1 billion

Merchandise Trade Balance (2001E): \$16.8 billion

Major Export Products: Crude oil, natural gas, re-exports, aluminum, dried fish, dates

Major Import Products: Manufactured goods, machinery, and transportation equipment, food

**Oil Export Revenues (2001E):** \$17.0 billion **International Reserves (2001E):** \$13.0 billion

# **ENERGY OVERVIEW**

Minister of Petroleum and Mineral Resources: Obeid bin Saif al-Nasiri

Proven Oil Reserves (1/1/01E): 97.8 billion barrels

Crude Oil Production (3rd Quarter of 2001E): 2.15 million bbl/d

OPEC Crude Oil Production Quota (effective 9/1/01): 2.03 million bbl/d

Oil Consumption (2001E): 331,000 bbl/d Net Oil Exports (2001E): 1.8 million bbl/d

Major Crude Oil Customers (2001E): Japan (60%), other Far East (20%)

Crude Oil Refining Capacity (1/1/01E): 443,500 bbl/d Natural gas Reserves (1/1/01E): 212 trillion cubic feet (Tcf)

Natural gas Production (1999E): 1.34 Tcf Natural gas Consumption (1999E): 1.11 Tcf Net Natural gas Exports (1999E): 0.23 Tcf

**Electric Generation Capacity (1/1/99E):** 5.6 gigawatts **Electricity Production (1999E):** 36.7 billion kilowatthours

#### **ENVIRONMENTAL OVERVIEW**

Minister of Electricity & Water: Humayd bin Nasir al-Uways

**Total Energy Consumption (1999E):** 1.9 quadrillion Btu\* (0.5% of world total energy consumption) **Energy-Related Carbon Emissions (1999E):** 32.2 million metric tons of carbon (0.5% of world total carbon emissions)

**Per Capita Energy Consumption (1999E):** 652.7 million Btu (vs. U.S. value of 355.8 million Btu) **Per Capita Carbon Emissions (1999E):** 11.2 metric tons of carbon (vs. U.S. value of 5.5 metric tons of carbon)

**Energy Intensity (1999E):** 43,616 Btu/\$1990 (vs U.S. value of 12,638 Btu/\$1990)\*\*

**Carbon Intensity (1999E):** 0.7 metric tons of carbon/thousand \$1990 (vs U.S. value of 0.19 metric tons/thousand \$1990)\*\*

**Sectoral Share of Energy Consumption (1998E):** Transportation (10.3%), Industrial (58.4%), Residential (16.2%), Commercial (15.1%)

**Sectoral Share of Carbon Emissions (1998E):** Industrial (56.7%), Transportation (13.2%), Residential (15.6%), Commercial (14.5%)

**Fuel Share of Energy Consumption (1999E):** Oil (38.2%), Natural gas (61.8%), Coal (0.0%)

**Fuel Share of Carbon Emissions (1999E):** Natural gas (54.2%), Oil (45.8%), Coal (0.0%)

**Renewable Energy Consumption (1998E):** 0.71 trillion Btu\* (0% increase from 1997)

Number of People per Motor Vehicle (1998): 71.4 (vs. U.S. value of 1.3)

**Status in Climate Change Negotiations:** Non-Annex I country under the United Nations Framework Convention on Climate Change (ratified December 29th, 1995). Not a signatory to the Kyoto Protocol.

**Major Environmental Issues:** Lack of natural freshwater resources being overcome by desalination plants; desertification; beach pollution from oil spills.

**Major International Environmental Agreements:** A party to Conventions on Climate Change, Desertification, Endangered Species, Hazardous Wastes, Marine Dumping and Ozone Layer Protection. Has signed, but not ratified, Biodiversity and Law of the Sea.

<sup>\*</sup> The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal,

solid biomass and animal products, biomass natural gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.

\*\*GDP based on EIA International Energy Annual 1999

#### **OIL AND NATURAL GAS INDUSTRIES**

**Organizations:** Abu Dhabi National Oil Company (ADNOC); Operates three main oil and natural gas operating companies, five Service companies, three joint ventures to fully utilize the produced natural gas, two maritime transport companies for crude oil, refined product and LNG and one refined product distribution company.

**Major Refineries:** Ruwais (145,000 bbl/d), Emirates National Oil Company (ENOC) - Dubai (120,000), Umm al-Nar (88,500 bbl/d), Metro Oil (Fujairah)(90,000 bbl/d)

Major Natural gas Processing Plants: Bab, Bu Hasa, Das Island, Habshan (2), Jebel Ali, Ruwais Major Oil Fields: *Abu Dhabi:* 'Asab, Bab, Bu Hasa, Al-Zakum *Dubai:* Fallah, Fateh, Southwest Fateh, Margham, Rashid *Sharjah:* Mubarak (near Abu Musa Island)

**Major Associated Natural gas Fields:** *Abu Dhabi:* Abu al-Bukhush, Bab, Bu Hasa, Umm Shaif, Zakum **Ports:** *Abu Dhabi:* Das Island, Delma Island, Jebel as Dhanna, Ruwais, Abu al Bukhush, Al Mubarraz, Zirku Island, Port Zayed, Umm al Nar *Dubai:* Jebel Ali, Fateh, Port Rashid *Sharjah:* Mubarak

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CIA World Factbook - United Arab Emirates

<u>U.S. State Department Country Commercial Guide - United Arab Emirates (requires Adobe Acrobat Reader)</u>

U.S. State Department Report on Economic Policy and Trade Practices - United Arab Emirates

U.S. State Department Consular Information Sheet - United Arab Emirates

U.S. Embassy, Abu Dhabi

U.S. Department of Energy - Office of Fossil Energy - International section - United Arab Emirates

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